

## Human amniotic fluid as a potential new source of organ specific precursor cells for future regenerative medicine applications.

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### Public Summary:

**PURPOSE:** Human amniotic fluid contains multiple cell types, including pluripotent and committed progenitor cells, and fully differentiated cells. We characterized various cell populations in amniotic fluid. **MATERIALS AND METHODS:** Optimum culture techniques for multiple cell line passages with minimal morphological change were established. Cell line analysis and characterization were done with reverse transcriptase and real-time polymerase chain reaction. Immunoseparation was done to distinguish native progenitor cell lines and their various subpopulations. **RESULTS:** Endodermal and mesodermal marker expression was greatest in samples of early gestational age while ectodermal markers showed a constant rate across all samples. Pluripotent and mesenchymal cells were always present but hematopoietic cell markers were expressed only in older samples. Specific markers for lung, kidney, liver and heart progenitor cells were increasingly expressed after 18 weeks of gestation. We specifically focused on a CD24+OB-cadherin+ population that could identify uninduced metanephric mesenchyma-like cells, which in vivo are nephron precursors. The CD24+OB-cadherin+ cell line was isolated and subjected to further immunoseparation to select 5 distinct amniotic fluid kidney progenitor cell subpopulations based on E-cadherin, podocalyxin, nephrin, TRKA and PDGFRA expression, respectively. **CONCLUSIONS:** These subpopulations may represent different precursor cell lineages committed to specific renal cell fates. Committed progenitor cells in amniotic fluid may provide an important and novel resource of useful cells for regenerative medicine purposes.

### Scientific Abstract:

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